DOCUMENT RESUME

ED 333 509 CS 507 490

AUTHOR Steinke, Jocelyn; Long, Marilee
TITLE Communicating Health Risks to the Public: A Content Analysis of Press Coverage of the Health Risks Associated with Video Display Terminal (VDT) Use.
PUB DATE May 91
NOTE 39p.; Paper presented at the Annual Meeting of the International Communication Association (41st, Chicago, IL, May 23-27, 1991).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Communication Research; Community Education; Content Analysis; Newspapers; *News Reporting; Public Health; Public Health Legislation; *Video Display Terminals
IDENTIFIERS *Communication Styles; Health Communication; Health Hazards; *Health Risk Appraisal; Journalism Research; News Stories; New York (Suffolk County)

ABSTRACT

A content analysis examined health risk communication statements in national and local press coverage in 1988 of a controversy over proposed legislation to regulate the use of video display terminals (VDTs) in the workplace in Suffolk County, New York. The health risk communication statements from a total of 55 randomly selected articles were categorized as cognitive or affective statements and as alarming, reassuring, neutral or balanced (both alarming and reassuring) statements. The articles were selected from the "New York Times," the Long Island edition of "Newsday," and "Suffolk Life." Results showed that national and local newspapers differed significantly in the percent of cognitive and reassuring risk information they presented, but not in the percent of affective or alarming information they presented. In addition, national and local newspapers differed significantly in their use of health risk frames for articles. No significant differences for any of the variables were found between the local newspapers. (Five tables of data are included, and two appendixes and 48 references are attached.) (Author/PRA)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED333509

Communicating Health Risks to the Public: A Content Analysis of Press Coverage of the Health Risks Associated with Video Display Terminal (VDT) Use

by

Jocelyn Steinke and Marilee Long
School of Journalism and Mass Communication
University of Wisconsin-Madison
5115 Vilas Hall
821 University Avenue
Madison, WI 53706
(608) 262-3691

BEST COPY AVAILABLE

CSSO 7490

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Jocelyn Steinke
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☒ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy

Communicating Health Risks to the Public: A Content Analysis of Press Coverage of the Health Risks Associated with Video Display Terminal (VDT) Use

by

Jocelyn Steinke and Marilee Long
School of Journalism and Mass Communication
University of Wisconsin-Madison
5115 Vilas Hall
821 University Avenue
Madison, WI 53706
(608) 262-3691

Paper Presented to the Health Communication Division
of the International Communication Association (ICA),
Chicago, Illinois, May 1991

CS507490

Jocelyn Steinke is completing her Ph.D. at the University of Wisconsin-Madison. Her research interests include science communication, information processing, and audience studies.

Marilee Long is also completing her Ph.D. at the University of Wisconsin-Madison. Her research interests include science communication, structure of science media messages, and science literacy and the media.

The authors would like to thank Professor Sharon Dunwoody and Professor Ronald Serlin for their helpful comments, and John Kalter for his assistance in coding articles.

Communicating Health Risks to the Public: A Content Analysis of Press Coverage of the Health Risks Associated with Video Display Terminal (VDT) Use

ABSTRACT

This content analysis was designed to study health risk communication statements in national and local press coverage in 1988 of a controversy over proposed legislation to regulate the use of video display terminals (VDTs) in the workplace in Suffolk County, New York. The health risk communication statements from a total of 55 randomly selected articles were categorized as cognitive or affective statements and as alarming, reassuring, neutral, or balanced (both alarming and reassuring) statements. The articles were selected from The New York Times, the Long Island edition of Newsday, and Suffolk Life.

The study found that national and local newspapers differed significantly in the percent of cognitive and reassuring risk information they presented, but not in the percent of affective or alarming information they presented. In addition, national and local newspapers differed significantly in their use of health risk frames for articles. No significant differences for any of the variables were found between the local newspapers.

INTRODUCTION

Mass communication researchers have acknowledged the critical role the mass media play in conveying information about health risks to the public and the influence of media coverage of health risks on public perceptions (Nelkin, 1989; Greenberg et al., 1989; Cole, 1988; Dunwoody, et al., 1986). Researchers have found that people rely almost exclusively on the mass media for information about science, technology, and health (Swinehart and McLeod, 1960; Tannenbaum, 1963; Cronholm and Sandell, 1981), including information about scientific, technological, and health risks (Nealey and Rankin, 1978). Nelkin states that the public understands science and technology less through direct experience than through the filter of journalism (Nelkin, 1985; 1987; 1989).

Concern over the tone, style, and type of information conveyed in risk communication messages has arisen because of the potential impact of these messages on public perceptions (Combs and Slovic, 1979; Freimuth and Van Nevel, 1981; Mazur, 1981; Dunwoody and Neuwirth, 1988). In the past, most research has analyzed the tone of mass mediated risk communication messages in order to determine whether these messages were balanced. The assumptions underlying this research were that messages which were overly alarming might lead to unnecessary panic and messages which were overly reassuring might lead to public complacency. Other research has examined how journalists' writing strategies influence audiences' judgments of risk (Dunwoody et al., 1987) and risk-engaging behaviors (Dunwoody and Neuwirth, 1988).

Little empirical evidence, however, is available on the types (cognitive or affective) of information conveyed in health risk communication statements. This research is important because the way the media communicate health risk information may affect how the public perceives and responds to these messages. Dunwoody and Neuwirth (1988) found that affective dimensions of risk are distinct from cognitive dimensions of risk in the minds of nonscientists. Because readers appear to make a distinction between cognitive and affective dimensions of risk, they also may respond to each of these dimensions of risk differently.

Likewise, because researchers have documented how the tone of risk statements can affect readers' perceptions and attitudes toward risks, research on the tone of both cognitive and affective health risk communication statements is also important. The tone (alarming, reassuring, neutral, or balanced), as well as the type (cognitive or affective), of mediated health risk information may influence the public's assessments of risks.

The purpose of this study was to analyze press coverage of a health risk controversy: the health risks associated with extended use of video display terminals (VDTs) in the workplace. In particular we were interested in studying the cognitive and affective content of risk communication statements, as well as the alarming and reassuring tone of these statements.

The VDT health risk controversy arose in Suffolk County, New York, which is one of two counties on Long Island. During 1988, this controversy was covered primarily by three newspapers: The New York Times, the Long Island edition of Newsday, and Suffolk

Life. While The New York Times addresses what could be considered a national audience, Newsday and Suffolk Life address a primarily local audience. This controversy provided us with an opportunity to compare how a "national" newspaper's coverage of a health risk controversy might differ from local newspapers' coverage of a health risk controversy.

RELEVANT LITERATURE

Impact of Media Coverage of Health Risks on the Public

The precise impact of media coverage of health risks on public perceptions and behavior is difficult to determine. Dunwoody et al. (1986) explain that "evidence of a causal link between media coverage of risk and people's risk perceptions is difficult to find" (p. 2). However, the public may turn to the mass media for information on how to react or behave when confronted by a risk. DeFleur and Ball-Rokeach (1989) argue in their Mass Media Dependency Theory that individuals form dependency relationships with the media based on a variety of goals, including "action orientation" (p. 306) goals. Individuals with action orientation goals rely on media channels for information on how to behave in specific situations. A middle-aged male with high cholesterol, for example, may rely on a newspaper article for information on cholesterol-reducing practices. A pregnant female who smokes may pay particular attention to a television report on the effects of smoking on unborn children.

Researchers have found that the mass media affect public perceptions of health risks by alerting the public to the presence of these risks. The agenda-setting role of the mass media in alerting the public to risks has been well-documented for a number of different scientific, technological, and health risks, including recombinant DNA research (Altimore, 1982; Goodell, 1986), nuclear power (Friedman, 1981; 1984; 1986), asbestos (Freimuth and Van Nevel, 1981), artificial sweeteners (Nelkin, 1987), chemical wastes (Nelkin, 1987), cocaine use (Danielian and Reese, 1989a), and AIDS (Rogers et al., 1991). In each of these cases, the media defined these issues as important. A convergence of media attention also has a significant effect on public perceptions. Reese and Danielian (1989b) found that the reporting of some risk issues, such as AIDS and cocaine use, is "characterized by a rapid convergence of media attention" (p. 29). Both the amount and frequency of coverage of an issue affect public perceptions of an issue, because the amount and frequency of coverage is seen as an indication of the importance of an issue (Goodell, 1987).

In addition to signalling the public's attention to health risks, the mass media may be instrumental in initiating attitudinal and behavioral changes. Hubbard et al. (1975) argue that the media may "play a role in setting action and cognitive agendas for people, in initiating attitude information about certain topics or events" (p. 24). The information that individuals derive from the mass media may lead readers and

viewers to change their risk-taking behavior. For example, in a study of 505 university undergraduates, Dunwoody and Neuwirth (1988) found that students used both mass media and interpersonal channels to obtain information about AIDS. However, they found that students relied on interpersonal channels for both affective and cognitive information about risk, and relied on mass media channels only for cognitive information about risk. However, the use of both interpersonal and mass media channels was correlated with reported changes in risky behavior.

Criticisms of Mass Mediated Heath Risk Information

Communicating health risks through the media is difficult, because most people lack a basic understanding of science that is necessary for fully comprehending the risks involved (Miller, Prewitt and Pearson, 1980; Glynn, 1986). In general, the public's overall conception of science and technology is somewhat vague and uncertain (Pion and Lipsey, 1981), mainly because "science has seemed to take place behind closed doors, in the invisible worlds of the microscope and mathematical theory" (Goodell, 1975) - worlds that are alien to a large segment of the general public (Miller, 1986). Risk communication is further complicated because many health risk issues are entangled in a web of political, economic, and legal complexities (Moore, 1989).

Researchers have heavily criticized mass media coverage of health risks, concluding that the information provided by the mass media about risks is "woefully inadequate" (Singer and

Endreny, 1987). A frequent complaint has been that journalists do not provide an adequate amount of information to promote public understanding. Singer and Endreny (1987) found that the mass media provide very little information about risks, but when they do provide information, it "may not be easily available in the most meaningful form" (p. 15). Similarly, Nelkin (1989) found:

> With some notable exceptions, print and broadcast stories on health risks seldom explore the scientific issues involved in risk disputes or the methods of risk analysis (p. 55).

Nelkin argues that such coverage leaves readers and viewers with little or no basis for making meaningful judgments about competing claims.

Other complaints by communication researchers further emphasize the inadequacies of media coverage of health risks. Friedman (1981) found that local media coverage of the Three Mile Island accident was superficial in nature. Most of the articles on the accident were straight hard news; there were few investigative articles, series, interpretative or background pieces. In addition, research by Friedman et al. (1987) indicates that newspaper and television network coverage of the Chernobyl incident did not provide enough coverage "both of the actual situations and [radiation] levels and of the explanatory information, that would have helped readers and viewers understand radiation and risk" (p. 78). Similarly, Freimuth et al. (1984) found that news coverage of cancer in newspapers

emphasized dying rather than coping, and was generally "fragmented and ephemeral" (p. 72).

Another complaint about media coverage of health risks is that it is often inaccurate. Cole (1988) states that health risk reporting may not "present an accurate picture of the state of scientific knowledge on these risks" (p. 437). Clarke (1988) contends that "individuals' sources of information (primarily television and newspapers) systematically distort the data on which those [risk] assessments are based" (p. 23).

In addition, researchers have criticized journalists for not providing a context when presenting health risk information and for not framing that information in a way that helps people make intelligent decisions about risks. Singer and Endreny (1987) note that the media rarely structure the debate with respect to any risk hazards; the media tend to accept the frames provided by dominant institutions and sources active in the debate. Other research indicates that the mass media frequently rely on public statements by government, military, and corporate officials for their information regarding technological risks (Clarke, 1988; Gans, 1979). Official statements may focus more on the political, economic and social issues involved in the debate about a particular risk, thus obscuring the health issues also involved in the debate.

Another frequent complaint about health risk reporting is that risk statements are biased: they are either unnecessarily alarming or falsely reassuring. According to journalistic

traditions, reporting on any controversial issue should be balanced. Goodell (1987) explains that: "the judgment of the journalist if any, as to the soundness of each side is to be reflected only in the order in which views are presented" (p. 589).

Similarly, other researchers have noticed that news coverage of technological risks is often one-sided, stressing the hazards and negative health risks or consequences associated with technologies (Wilkins and Patterson, 1987; Singer and Endreny, 1987). Wilkins and Patterson (1987) found a consistent alarming slant in media coverage of risks. They stated that in "its traditional selection and ordering of information, news does not report risk, but rather the negative consequences of assuming that risk" (p. 82). Singer and Endreny (1987) emphasize that the alarming aspect of risks is highlighted in the media, because negative news is valued as more newsworthy. They point out that newsworthiness is the most important criterion for reporting risks. In the news business:

> a rare hazard is more newsworthy than a common one, other things being equal; a new hazard is more newsworthy than an old one; and a dramatic hazard - one that kills many people at once, suddenly or mysteriously - is more newsworthy than a long-familiar illness (p. 13).

Cole (1988) explains that even "competent science reporters face pressures in negotiation to tone their stories up rather than down" (p. 457). Science writers are often encouraged to highlight the dramatic aspects of a story.

Stephens and Edison (1982) stressed the potential impact that an imbalance in the tone of an article may have on the public. They maintained that during the accident at Three Mile Island, "any slant in coverage of the major issues during the accident could have affected public opinion on the controversy" (p. 199). They further argue that "overly alarming coverage could have spread panic; overly reassuring coverage could have risked lives" (p. 199).

BACKGROUND ON THE VDT CONTROVERSY

The Suffolk County VDT Bill

Debate exists within the scientific community as to whether extended use of VDTs in the workplace leads to health problems. Some studies indicate that health risks are not associated with VDT use, while other studies suggest that health risks are associated with VDT use. Concern over the health risks caused by VDT use first arose after frequent complaints from VDT users about eye strain, neck pain, headaches, muscle fatigue, heart pain, and back pain (Jones, 1983; Silberner, 1985). Additional concern emerged after several incidents of abortions, miscarriages, and birth defects were reported among women who were exposed to extended VDT use (Ross, 1989). At present, no conclusive medical evidence exists about whether ergonomic factors associated with VDT use or the low-level electromagnetic radiation emitted from VDTs are responsible for the health problems reported by VDT users. However, concern over the

potential health risks of VDT use in the workplace became a matter of much controversy in 1987 and 1988 among VDT users, unions, business owners, and politicians in Suffolk County, New York.

In 1987, a bill was introduced by the Suffolk County Legislature to regulate the extended use of VDTs in the workplace. The bill was proposed because of concern that extended use of VDTs might lead to a number of health problems, such as eye strain, skin rashes, headaches, musculo-skeletal ailments, and pregnancy complications. If passed, the bill would require businesses in Suffolk County that employ more than 20 full-time VDT operators to pay 80 percent of annual eye exams and eye wear costs, improve the ergonomics of VDT work stations, and educate employees about safer VDT use.

A number of groups opposed the legislation. The VDT users and their unions thought the bill was too weak; they wanted even stricter regulation of VDTs in the workplace. Business people said the bill imposed an unfair economic burden on local business. Some civic leaders were worried that the proposed regulations would discourage businesses from locating in Suffolk County and cause others to leave the county.

Over time, the bill was vetoed by two successive county executives, partly on the basis of inconclusive medical evidence. However, the Suffolk County Legislature overrode the second county executive's veto by a vote of 13 to 5. On May 10, 1988, the Suffolk County Legislature adopted the "VDT Law." The

Suffolk County VDT legislation, Local Law 21, was the first of its kind in the country. However, on December 27, 1989, in ILC Data Device Corp., et al., v. County of Suffolk, the Supreme Court of the State of New York declared the VDT law invalid on the basis that the County Legislature did not have the authority to enact the "VDT Law."

Since the Suffolk County VDT legislation was passed in 1988, Germany, Japan, and some Scandinavian countries have passed similar legislation (Kassler, 1991). In the United States, the San Francisco Board of Supervisors also passed similar legislation in December 1990 (Lewis, 1991).

Newspaper Coverage of the Suffolk County VDT Bill

Before the introduction of the VDT bill in Suffolk County, New York, a few scientific journals and scientific magazines addressed the potential health risks associated with extended VDT use. Following the introduction of the bill in 1987, the local press picked up the issue. Throughout 1987 and 1988, two local newspapers, Long Island Newsday and Suffolk Life, offered regular coverage of the controversy. As the controversy intensified, a national newspaper, The New York Times, focused its attention on the issue.

RESEARCH DESIGN

The VDT bill controversy provided the ideal opportunity to examine press coverage of a health risk issue in a national and

in local newspapers. We chose The New York Times, the Long Island edition of Newsday, and Suffolk Life for our content analysis because these three papers regularly covered the controversy over the proposed VDT regulation in Suffolk County. By choosing these three papers for analysis, we could compare the differences in coverage between national (The New York Times) and local (Newsday and Suffolk Life) publications.

The purpose of this study was to determine whether national and local newspapers differed in the way they presented health risk information about VDTs. We were interested in analyzing the types of risk communication information in the newspapers, not the effects of the risk information on readers. When conveying health risk information to the public, journalists who have been trained to be objective probably prefer the objective credibility of cognitive risk communication statements over the emotional subjectivity of affective risk communication statements. However, even a cognitive risk communication statement can have an affective (alarming or reassuring) tone. This research explores the types of health risk communication statements (cognitive or affective) and the tone of health risk communication statements (neutral, alarming, reassuring, or balanced) in national and local coverage of local controversy over the health risks associated with extended VDT use in the workplace.

We expected to find differences in coverage between the national and local newspapers because of the different ways the

newspapers define their audience. The New York Times primarily addresses a national audience. Long Island Newsday and Suffolk Life primarily address a local audience. While The New York Times emphasizes New York City news to some extent, it also covers a range of national issues relevant to readers across the country. Furthermore, The New York Times is readily available at newsstands across the country. Long Island Newsday and Suffolk Life, however, are defined as local newspapers because neither of these newspapers has a national circulation and their emphasis is on local news.

We also expected both Newsday and Suffolk Life to be more closely tied to the social structure of the community than The New York Times. Thus, we expected differences between local and national coverage of this issue because the editors and reporters of local newspapers were more attuned to the sensitivity of this issue for both local officials and residents, and thus they may be more heavily influenced by community crises. As Tichenor, Donohue, and Olien (1980) explain:

> Their [editors and reporters] perspectives on the situation, their range of choices, and their rationales for decisions are constrained by their roles within the community structure and by their linkages with different internal and external substructures (p. 109).

Consequently, we were curious as to whether differences in the types of risk statements (cognitive or affective) and the tone of these statements (alarming or reassuring) existed between a newspaper with a "national" audience and newspapers with a local audience.

Even though we expected both of the local newspapers to cover this issue similarly, we were concerned that the differences in their available resources might lead to differences in the way these two newspapers covered this issue. The Long Island edition of Newsday is produced by a relatively large news organization with a large staff and budget, and Suffolk Life is produced by a much smaller news organization with a much smaller staff and budget. The Long Island edition of Newsday has a paid daily circulation of 711,264, while Suffolk Life is a free weekly newspaper with a circulation of 18,586. Thus, we also compared both of the local newspapers' coverage of this issue to test whether they were covering this issue similarly.

Because of the exploratory nature of this study, we made our hypotheses non-directional. The hypotheses posed for this study are as follows:

> Hypothesis 1: The percent of cognitive information about VDT health risks will differ between national and local newspapers. Likewise, the percent of affective information will differ between national and local newspapers
>
> Hypothesis 2: The percent of cognitive information about VDT health risks will differ between the two local newspapers. Likewise, the percent of affective information will differ between the two local newspapers.
>
> Hypothesis 3: The percent of alarming information about VDT health risks will differ between national and local newspapers. The percent of reassuring information will also differ between national and local newspapers

Hypothesis 4: The percent of alarming information about VDT health risks will differ between the two local newspapers. The percent of reassuring information will also differ between the two local newspapers.

Hypothesis 5: National and local newspapers will differ in the percent of articles they run that have a health risk frame in the lead. The two local newspapers will differ in the percent of articles they run that have a health risk frame in the lead.

We expected risk reporting behavior to be similar for all of the stories within a paper. Therefore, our unit of analysis was the individual paper. We compared the type (cognitive or affective) and tone (alarming, reassuring, neutral, or balanced) of health risk communication statements across newspapers.

We performed a content analysis of the VDT-related health risk statements found in a random sample of news articles about the VDT controversy in the three selected newspapers during 1988. We selected 1988 for our analysis, because 81.5 percent of the articles written about the VDT controversy appeared during this year. For our analysis, we randomly chose 20 newspaper articles from each of our selected newspapers, for a total of 60 articles.

Based on previous conceptualizations of risk (Dunwoody and Neuwirth, 1988), we defined VDT health risk statements as sentences containing information about the existence, severity, or acceptability of VDT health risks. We then coded all statements meeting this criterion into one of seven categories: cognitive alarming, cognitive reassuring, both cognitive alarming and reassuring, cognitive neutral, affective alarming, affective reassuring, and both affective alarming and reassuring.

Cognitive risk statements were defined as statements intended to prompt the reader to think by providing information on the health risks associated with VDT use. Risk statements were coded as cognitive if they provided information about study findings, expert opinions (those in which the person was speaking as a scientific expert), specific incidents of harm, and estimates of injury or death.

Affective risk statements were defined as statements that evoked an emotional response to the health risks associated with VDT use. These statements included anecdotes, testimonials based on personal experience, and personal opinions.

Cognitive and affective statements were coded for their emphasis or slant. Statements that claimed VDT use did or might cause health problems were coded as alarming, and statements that claimed VDT use did not or did not appear to cause health problems were coded as reassuring. Statements that provided both alarming and reassuring information were coded in the "both alarming and reassuring" category.

Statements about VDT health risks that did not have a slant were coded as neutral. The statements that fell into this category were those that mentioned provisions of the VDT bill before lawmaking bodies and those that mentioned office regulations about VDT use. In addition, statements mentioning future research on VDT health risks were coded as neutral.

The lead, the first paragraph of each article, was coded for the frame it provided for the story. The frame of the lead was

coded as a "health risk" frame or as an "other" frame. Health risk frames were those that focused on the potential health risks from long-term VDT use. Leads falling into the "other" category included leads with a political frame, those that focused on the political process necessary to pass the bill, and leads with an economic frame, those that focused on the potential economic effects of the VDT legislation on businesses located in Suffolk County or on businesses that might locate in Suffolk County.

Intercoder reliability was calculated on a subset of the random sample of articles. Pearson correlations for the number of statements per article falling into each of the health risk statement categories ranged from .80 to 1.0. Because of the nominal nature of the variable used to code the frame in the lead of each article ("1" = health risk, "0" = other), we used Scott's Pi to determine our reliability on this variable (Holsti, 1969); the Scott's Pi coefficient was .71.

RESULTS AND DISCUSSION

To answer our hypotheses, we summed the total number of each type of risk statement (cognitive, affective, alarming, and reassuring) for each story (e.g., to get the total number of cognitive risk statements in a story, we summed the cognitive alarming, cognitive reassuring, cognitive neutral, and cognitive both alarming and reassuring categories); we then divided each of these totals by the number of sentences in each story, and multiplied this number by 100. These calculations gave us the

percentages of the types of risk statements in each of the stories. These were then averaged to obtain a mean percentage for each newspaper. Table 1 provides descriptive data on the variables for each newspaper.

Table 1. Descriptive statistics for the three newspapers used in this study (The New York Times = 20, Newsday = 20; Suffolk Life = 15[1]).

Newspaper	Mean Percent of Statements	Skewness	Kurtosis
The New York Times			
Cognitive	31.71	0.60	-0.78
Affective	1.13	2.57	5.90
Alarming	11.70	0.65	-0.85
Reassuring	7.47	1.33	1.50
Newsday			
Cognitive	18.18	1.72	3.16
Affective	0.37	4.47	20.00
Alarming	9.04	3.22	11.64
Reassuring	2.00	2.36	4.85
Suffolk Life			
Cognitive	9.76	0.24	-1.17
Affective	0.50	2.47	4.91
Alarming	2.50	0.59	-1.33
Reassuring	0.84	1.51	0.63

Though the means differ from newspaper to newspaper, the health risk information provided within each newspaper follows the same pattern. That is, each paper devoted the most space to cognitive health risk statements, followed by alarming, reassuring, and affective health risk statements. Furthermore, each newspaper included at least twice as much cognitive information as it did any other category of health risk information. This finding is

[1]Due to a coding error, five stories had to be dropped from the Suffolk Life group.

not surprising, given that reporters and editors generally believe that one of their primary jobs is to inform their readers.

The skewness and kurtosis of the mean percentages for each risk statement category indicate that the data were not normally distributed (see Appendix A for a list of the data used in the analysis). Consequently, we used the nonparametric Kruskal-Wallis test (Marascuilo and Serlin, 1988; Daniel, 1990) to compare the newspapers' percentages of cognitive, affective, alarming, and reassuring statements. A large-sample approximation procedure was used to calculate the nonparametric test statistic (Marascuilo and Serlin, 1988). We compared our test statistic to critical values obtained from a chi-square table (Marascuilo and Serlin, 1988).

Examples of the different types of risks statements (cognitive, affective, alarming, and reassuring) found in the articles are presented in Appendix B.

The results of the comparison between national and local newspapers are summarized in Table 2.

Table 2. Mean rank of percent of cognitive, affective, alarming, and reassuring risk statements for local newspapers (N = 35) and the national (N = 20) newspaper.

Type of Statement	National Newspapers	Local Newspaper	Chi-Square Value
Cognitive	35.53	23.70	6.94*
Affective	29.30	27.26	0.71
Alarming	33.18	25.04	3.54
Reassuring	37.93	22.33	14.40*

*Significant at $p < .05$, two tailed.

As noted in Table 2, significant differences were found between the two groups for the mean percentage of article space devoted to cognitive information and to reassuring information.

One explanation for the significant difference in the percent of cognitive risk information lies in the differences between the perceived audiences for national and local newspapers. Long Island residents, including residents of Suffolk County, are the primary audience members for the local newspapers, while the primary audience for The New York Times covers a much larger geographic region. Thus, The New York Times may have chosen to present more cognitive risk information, because this information may have seemed more important to present more cognitive, background information on the issue to a national audience that was less familiar with the issue.

A significant difference between national newspapers and local newspapers in terms of the mean percent of reassuring information presented in news articles about the VDT controversy also may be attributed to differences in perceived audiences. Clearly, a national audience has less of a vested interest in the VDT controversy than a local audience. Reporters covering this issue for The New York Times may have been more likely to use a reassuring tone in their articles, given the fact that this was a local controversy that did not directly affect a national audience. Whereas, the reporters covering this issue for the local newspapers were perhaps much more cautious about balancing their articles, fearing that articles with either a overly

reassuring tone could color local residents' perceptions of this issue and could lead to public complacency.

No significant differences were found between national and local newspapers concerning the percentages of affective and alarming information.

The results of the comparison between the two local newspapers are presented in Table 3.

Table 3. Mean rank of percent of cognitive, affective, alarming, and reassuring risk statements for Newsday (N = 20) and Suffolk Life (N = 15).

Type of Statement	Newsday	Suffolk Life	Chi-Square Value
Cognitive	26.5	20.03	1.38
Affective	26.4	28.4	0.46
Alarming	27.38	21.93	1.07
Reassuring	22.4	22.23	0.00

As the table indicates, no significant differences were found when the two local newspapers were compared. Our analyses show that the two newspapers provided essentially the same types of risk communication information to their readers. This finding indicates that these two newspapers did act in a similar manner when covering this health risk issue, even though they varied in terms of available resources.

To assess whether the national newspaper and the local newspapers differed in their use of health risk frames in the lead, we performed a large-sample approximation of the Fisher-Irwin test and compared our test statistic to a z critical value

(Daniel, 1990). The results of our anlysis of the use of a health risk frame in the lead are summarized in Table 4.

Table 4. Percent of articles having a health risk lead for the national newspaper (N = 20) and the local (N = 35) newspapers.

Type of Lead	Local Newspapers	National Newspapers	Z Score Value
Health	14.3	40.0	-2.15*

*Significant at $p < .05$, two tailed.

As Table 4 indicates, the national newspaper and the local newspapers differed significantly in their use of health risk frames in the lead. It appears that The New York Times framed the controversy as a health risk issue more often, while the local newspapers framed the controversy in other ways, e.g., as a political or economic issue. This difference in framing may be due to differences in the ties the newspapers has with the community and the extent to which influential community members' agendas affect the newspapers' agendas.

To determine whether the two local newspapers differed in their use of health risk frames, we performed a Fisher Exact test (Daniel, 1990). As shown in Table 5, the results of the exact test indicate that the two local newspapers did not differ significantly in their use of health risk frames in the lead.

Table 5. Percent of articles having a health risk lead for Newsday (N = 20) and Suffolk Life (N = 15).

Type of Lead	Newsday	Suffolk Life
Health	15	13.3

Again, this result suggests that even though the two newspapers have different resource bases, they framed the VDT controversy in a similar manner.

CONCLUSIONS

The results of this content analysis indicate the type (cognitive and affective) and tone (alarming and reassuring) of health risk information presented in news articles published by local and national newspapers. Specifically, these findings show the ways in which national and local newspapers differed in their coverage of a community-based health risk issue, in terms of the type of health risk statements used and the tone of these statements. Such information may be useful in evaluating the quality of press coverage of health risks.

The results of this study indicate that the health risk statements about VDT use in the news articles we examined from The New York Times did differ from those from the two local newspapers, Long Island Newsday and Suffolk Life. We found differences in the type of statements used and the tone of these statements. News articles from the national newspaper contained more cognitive information and more reassuring information than did news articles from the two local newspapers.

The differences we found may be attributed to the different perceptions national and local newspapers have of their audience. The VDT controversy was not a new issue for most community residents, whereas it probably was for most residents outside of the community. Thus, the national newspaper may have presented more cognitive information, because a national audience would need more cognitive, background information than a local audience would. Because this was a much publicized issue in the local community, local newspapers may have presented less cognitive, background information, assuming that their readers already had the necessary background information needed to understand this issue.

The results of this study show that both of the local newspapers were particularly cautious about coloring their articles. The tone of the health risk statements in news articles from the local newspapers were neither overly reassuring nor overly alarming, perhaps because the reporters from the local newspapers were more attuned to the sensitive nature of this issue within the community. Fearing that any coloring of the issue might affect public perceptions, reporters working for local newspapers may have been more hesitant to include reassuring or alarming information. However, reporters from the national newspaper appear not to have been as cautious about coloring their articles. Articles from the national newspaper tended to contain more reassuring health risk statements in their articles, perhaps because reporters for the national newspaper

were less conscious and less worried about the affect the tone of their articles might have on their audience.

This study reveals that both national and local newspapers had only a small percentage of affective health risk information in their articles. This finding may reflect the press's observance of the traditional norm of objectivity -- reporting only the "facts." Reporters may have felt that affective information was too subjective to include in their articles.

We also found that articles from both national and local newspapers had only a small percentage of alarming statements about risks. Reporters from all of these newspapers were probably trying to avoid any reporting that could have been viewed as sensationalistic. Given the discrepancies that exist within the scientific community about the potential risks associated with extended use of VDTs, reporters probably hesitated to print information that might alarm the public.

We also found that the national and local newspapers also differed in their use of health risk frames for their news stories. This difference may be attributed to newspapers' differing perceptions of their ties to the community. Newsday and Suffolk Life, which had closer ties to the community, may have focused more on the economic and political dimensions involved in this controversy in order to avoid conflict. Politicians and businesses, influential community leaders, were opposed to the VDT legislation and continually downplayed the health-related dimensions of this issue. The local press seems

to have picked up more on the political and economic dimensions of this controversy, thus downplaying the health-related dimensions. Politicians and businesses may have influenced how the local press covered this issue. The The New York Times, being a national newspaper, is less tied to the community structure. They tended to focus on the health-related dimensions of this controversy.

We found that the two local newspapers did not differ in their use of health risk communication statements, even though they have different available resources. Similar audience perceptions and similar ties to the community structure may have overrode any differences in coverage that could have been attributed to the newspapers' differences in terms of available resources.

This research can help communication researchers better evaluate how the public responds to health risk information conveyed by the media. In the past, researchers have used experimentally manipulated versions of health risk news articles, based on their assumptions of the content of health risk news articles, to assess readers' responses to health risk statements. This study, however, provides specific information about the type of statements used in news articles about health risks and the tone of those statements.

This research was limited to press coverage of a single health risk issue, which was covered mainly by three newspapers. Additional research involving the coverage of multiple health

risk issues by a larger sample of newspapers is necessary to provide further support for our findings. Additional research on the ways readers respond to the types of health risk communication statements presented in the press is also needed.

Appendix A

Percentage of each risk statement type per story before ranking and the type of lead per story

ArtID.	Paper[a]	Cog.	Affect.	Alarm.	Reas.	Lead[b]
1	1	15.00	0.00	0.00	5.00	0
2	1	21.88	0.00	3.13	6.25	0
3	1	15.38	0.00	7.69	7.69	0
4	1	76.32	0.00	21.05	28.95	1
8	2	3.23	0.00	3.23	0.00	0
9	2	5.00	0.00	5.00	0.00	0
10	2	42.11	0.00	26.32	15.79	0
12	2	24.00	0.00	0.00	0.00	0
13	2	10.00	0.00	5.00	0.00	0
14	2	75.00	0.00	75.00	0.00	1
15	1	8.11	0.00	0.00	0.00	0
16	3	0.00	0.00	0.00	0.00	0
18	2	5.41	0.00	2.70	2.70	0
19	2	0.00	0.00	0.00	0.00	1
21	2	5.26	0.00	5.26	0.00	0
25	2	10.00	0.00	3.33	0.00	0
27	2	10.00	0.00	0.00	0.00	0
28	2	3.57	0.00	3.57	0.00	0
30	2	10.20	0.00	0.00	2.04	0
31	2	3.23	0.00	0.00	0.00	0
39	1	33.33	0.00	0.00	0.00	0
44	1	0.00	0.00	0.00	0.00	0
45	1	0.00	0.00	0.00	0.00	0
57	2	25.00	0.00	12.50	0.00	0
58	2	22.22	0.00	0.00	0.00	0
62	2	48.15	7.41	22.22	11.11	1
63	2	28.57	0.00	0.00	0.00	0
65	2	7.69	0.00	0.00	0.00	0
66	2	25.00	0.00	16.67	8.33	0
69	3	0.00	0.00	0.00	0.00	0
70	3	10.71	0.00	3.57	0.00	0
71	3	20.83	4.17	4.17	4.17	0
72	3	20.69	0.00	6.90	3.45	1
73	3	5.88	0.00	0.00	0.00	0

[a]The New York Times = 1, Newsday = 2, Suffolk Life = 3

[b]Health risk = 1, no health risk = 0

Artid.	Paper[a]	Cog.	Affect.	Alarm.	Reas.	Lead[b]
75	3	20.00	3.33	6.67	3.33	0
76	3	7.69	0.00	7.69	0.00	0
77	3	3.13	0.00	0.00	0.00	0
78	3	15.38	0.00	0.00	0.00	0
79	3	13.64	0.00	4.55	0.00	1
80	3	4.76	0.00	0.00	1.59	0
81	3	10.00	0.00	0.00	0.00	0
82	3	12.00	0.00	4.00	0.00	0
83	3	1.69	0.00	0.00	0.00	0
84	1	26.00	0.00	8.00	0.00	0
85	1	55.56	0.00	33.33	16.67	1
86	1	54.55	0.00	12.12	6.06	1
87	1	4.55	0.00	0.00	2.27	0
88	1	81.40	4.65	34.88	16.28	1
89	1	54.39	10.53	28.07	19.30	1
90	1	17.24	0.00	10.34	6.90	1
91	1	8.33	0.00	0.00	2.78	0
92	1	23.08	0.00	11.54	7.69	0
93	1	30.77	0.00	19.23	3.85	0
94	1	65.85	0.00	19.51	14.63	1
96	1	42.50	7.50	25.00	5.00	1

[a]The New York Times = 1, Newsday = 2, Suffolk Life = 3

[b]Health risk = 1, no health risk = 0

APPENDIX B

Examples of Risk Communication Statements Found in the Sample

AFFECTIVE ALARMING

"'Everyone is real frightened,' said one woman who had a miscarriage and asked not to be identified, citing a recent memo discouraging employees from answering inquiries on the subject."
- Newsday, December 10, 1988

"It wasn't until the chiropractor asked if I used a computer at work that I began to pay attention to how I was contorting myself to meet the machines's needs."
- The New York Times, July 12, 1988

"People imagine a little nuclear power plant zapping their baby."
- The New York Times, July 10, 1988

AFFECTIVE REASSURING

"What some people think are health problems, like (deteriorating) vision, I feel are just a normal part of (aging).'"
- Suffolk Life, March, 2, 1988

AFFECTIVE ALARMING AND REASSURING

"I had perfect vision until a year or so after I started using a video display terminal at work, for example, although the case of the vision degradation can never be proven."
- The New York Times, July 12, 1988

COGNITIVE NEUTRAL

"The jury is still out over the long-term health risks of using personal computers, at least regarding low-level electromagnetic radiation from the computer monitor."
- The New York Times, July 12, 1988

COGNITIVE ALARMING

"Women who used video display terminals for more than 20 hours each week in the first three months of pregnancy suffered almost twice as many miscarriages as women doing other types of office work, according to a new study."
- The New York Times, June 5, 1983

COGNITIVE REASSURING

"It [a specific scientific study of VDT health risks] clearly does not show what causes this risk... and it is very likely that it [the risk] is caused by other factors."
- Newsday, June 7, 1988

COGNITIVE ALARMING AND REASSURING

"The latest research raises new fears that the terminals might be linked to miscarriages or birth defects in pregnant women, but the findings are only preliminary and suggestive according to the researchers."
- The New York Times, June 16, 1988

REFERENCES

Altimore, Michael (1982) "The Social Construction of a Scientific Controversy: Comments on Press Coverage of the Recombinant DNA Debate," Science, Technology and Human Values 7:24-31.

Clarke, Lee (1988) "Explaining Choices Among Technological Risks," Social Problems 35:22-35.

Cole, Jonathan (1988) "Dietary Cholesterol and Heart Disease: The Construction of a Medical Fact," in Surveying Social Life, ed. by Hubert O'Gorman, (Connecticut: Wesleyan University Press) pp. 437-466.

Combs, Barbara and Slovic, Paul (1979) "Newspaper Coverage of Causes of Death," Journalism Quarterly 56:837-843.

Cronholm, Margareta and Sandell, Rolf (1981) "Scientific Information: A Review of the Research," Journal of Communication 31:85-96.

Daniel, Wayne W. (1990) Applied Nonparametric Statistics, second edition, (Boston: PWS-KENT Publishing Co.).

Danielian, Lucig H. and Reese, Stephen D. (1989a) "A Closer Look at Intermedia Influences on Agenda Setting: The Cocaine Issue 1986,"in Communication Campaigns About Drugs: Government, Media, and the Public, edited by Pamela J. Shoemaker (New Jersey: Lawrence Erlbaum Associates, Publishers).

Danielian, Lucig H. and Reese, Stephen D. (1989b) "Intermedia Influence and the Drug Issue: Converging on Cocaine,"in Communication Campaigns About Drugs: Government, Media, and the Public, edited by Pamela J. Shoemaker (New Jersey: Lawrence Erlbaum Associates, Publishers).

DeFleur, Melvin and Ball-Rokeach, Sandra (1989) "Mass Media Dependency Theory," in Theories of Mass Communication, 5th edition, (New York: Longman).

Dunwoody, Sharon,; Tankard, James W.; and Ryan, Michael (1986) "Risk Analysis for Public Consumption: Media Coverage of the Ginna Nuclear Reactor Accident," Paper presented to the Mass Communication and Society Division and the Science Writing Educators' Group, Association for Education in Journalism and Mass Communication Annual Convention, Norman, OK, August 1986.

Dunwoody, Sharon,; Friestad, Marion,; and Shapiro, Michael A. (1987) "Conveying Risk Information in the Mass Media," Paper Presented to the Mass Communication Division of the International Communication Association, May 1987.

Dunwoody, Sharon and Neuwirth, Kurt (1988) "Information Channels, AIDS Risk Judgments and Reported Behavioral Change," Revised version of a paper presented at the annual meeting of the Association in Journalism and Mass Communication in Portland, OR, June 1988.

Freimuth, Vicki and Van Nevel, J. Paul (1981) "Reaching the Public: The Asbestos Awareness Campaign," Journal of Communication 31:155-167.

Freimuth, Vicki S.; Greenberg, Rachel H.; DeWitt, Jean; and Romano, Rose Mary (1984) "Covering Cancer: Newspapers and the Public Interest," Journal of Communication 34:62-73.

Friedman, Sharon M. (1981) "Blueprint for Breakdown: Three Mile Island and the Media Before the Accident," Journal of Communication 31:116-128.

Friedman, Sharon M. (1984) "Environmental Reporting Before and After TMI," Environment 4-5,34.

Friedman, Sharon M. (1986) "A Case of Benign Neglect: Coverage of Three Mile Island Before the Accident," in Scientists and Journalists: Reporting Science as News, edited by Sharon M. Friedman, Sharon Dunwoody and Carol L. Rogers (New York: The Free Press).

Friedman, Sharon M. (1987) "Reporting on Radiation: A Content Analysis of Chernobyl Coverage," Journal of Communication 37:58-79.

Gans, Herbert (1979) Deciding What's News (New York: Pantheon Books).

Glynn, Carroll J. (1986) "Perceptions of Communication Use in Science Policy Decision Making." Paper presented at the American Association for Public Opinion Research, St. Petersburg, Florida, May, 1986.

Goodell, Rae (1975) The Visible Scientists (Boston, Little, Brown and Co.).

Goodell, Rae (1986) "How to Kill a Controversy: The Case of Recombinant DNA," in Scientists and Journalists: Reporting Science as News, edited by Sharon M. Friedman, Sharon Dunwoody and Carol L. Rogers (New York: The Free Press).

Goodell, Rae (1987) "The Role of the Mass Media in Scientific Controversies," in Scientific Controversies, ed. by Tristram Engelhardt Jr., and Arthur L. Caplan (New York: Cambridge University Press) 585-597.

Greenberg, Michael R., Sachsman, David B., Sandman, Peter M. and Salomone, Kandice L. (1989) "Network Evening News Coverage of Environmental Risk," Risk Analysis 9:119-126.

Holsti, Ole R. (1969) Content Analysis for the Social Sciences and Humanities, (Reading, MA: Addison-Wesley Publishing Co.).

Hubbard, Jeffrey C., DeFleur, Melvin L. and DeFleur, Lois B. (1975) "Mass Media Influences on Public Conceptions of Social Problems." Social Problems 23:22-34.

Jones, James (1983) "Video Radiation: Fears Out of Focus," Technology Review 89:80-82.

Kassler, Jeanne, "Job-Related Ailments in Offices Rising," The New York Times, February 24, 1991.

Lewis, Peter H., "Are Computer Safety Laws Taking the Right Tack?" The New York Times, January 6, 1991.

Marascuilo, Leonard A. and Serlin, Ronald C. (1988) Statistical Methods for the Social and Behavioral Sciences. (New York: W.H. Freeman and Company.

Mazur, Allan (1981) "Media Coverage and Public Opinion on Scientific Controversies," Journal of Communication 31:106-115.

Miller, Jon D., Prewitt, K. and Pearson, R. (1980) The Attitudes of the Public Toward Science and Technology: Analytic Report. Report to the National Science Foundation, Chicago, National Opinion Research Center.

Miller, Jon D. (1986) "Reaching the Attentive and Interested Publics for Science," in Scientists and Journalists: Reporting Science as News, edited by Sharon M. Friedman, Sharon Dunwoody and Carol L. Rogers (New York: The Free Press).

Moore, Mike (1989) "Beware the Bracken Fern," in Health Risks and the Press: Perspectives on Media Coverage of Risk Assessment and Health (Washington, D.C.: The Media Institute).

Nealey, S.M. and Rankin, W.L. (1978) "Nuclear Knowledge and Nuclear Attitudes: Is Ignorance Bliss?" Mimeo. Battelle Memorial Institute, Seattle, Washington.

Nelkin, Dorothy (1985) "Managing Biomedical News," Social Research 53:625-646.

Nelkin, Dorothy (1987) Selling Science (New York: W.H. Freeman and Company).

Nelkin, Dorothy (1989) "Journalism and Science: The Creative Tension," in Health Risks and the Press: Perspectives on Media Coverage of Risk Assessment and Health (Washington, D.C.: The Media Institute).

Pion, Georgine M. and Lipsey, Mark W. (1981) "Public Attitudes Toward Science and Technology: What Have the Surveys Told Us?" Public Opinion Quarterly 45:303-316.

Rogers, Everett M.; Dearing, James W.; Chang, Soonbum (1991) "AIDS in the 1980s: The Agenda-Setting Process for a Public Issue," Journalism Monographs, No. 126.

Ross, Randy (1989) "VDTs: Are They Safe," PC Computing, March, pp. 146-147.

Silberner, Joanne (1985) "Heart Work," Science News 127:78.

Singer, Eleanor and Endreny, Phyllis (1987) "Reporting Hazards: Their Benefits and Costs," Journal of Communication 37:10-27.

Stephens, Mitchell and Edison, Nadyne G. (1982) "News Media Coverage of Issues During the Accident at Three-Mile Island," Journalism Quarterly 59:199-204.

Swinehart, James W. and McLeod, Jack M. (1960) "News About Science: Channels, Audiences, and Effects," Public Opinion Quarterly 24:583-589.

Tannenbaum, Percy (1963) "Communication of Scientific Information," Science 140:579-583.

Tichenor, Phillip; Donohue, George; and Olien, Clarice (1980) Community Conflict and the Press (California: Sage).

Wilkins, Lee and Patterson, Philip (1987) "Risk Analysis and the Construction of News," Journal of Communication 37:80-92.